September 26, 2005

STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION - DIVISION OF WATER QUALITY
November 16, 2005

ITEM 11

SUBJECT

CONSIDERATION OF A RESOLUTION APPROVING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS TO CONTROL FACTORS CONTRIBUTING TO DISSOLVED OXYGEN IMPAIRMENT IN THE STOCKTON DEEP WATER SHIP CHANNEL

DISCUSSION

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) adopted a revised Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) under Resolution No. 94-380 on December 9, 1994. The revised Basin Plan was approved by the State Water Resources Control Board (State Water Board) on February 16, 1995, by the Office of Administrative Law (OAL) on May 9, 1995, and by the U.S. Environmental Protection Agency (USEPA) on May 26, 2000.

The Basin Plan sets standards to protect all waters in the Sacramento and San Joaquin River Basins and prescribes programs to implement these standards. The standards consist of the designated beneficial uses of the waters, narrative and numeric objectives to protect these uses, and the State's Antidegradation Policy.

In 1998, pursuant to section 303(d) of the federal Clean Water Act (CWA), the Central Valley Water Board first identified the Stockton Deep Water Ship Channel (DWSC) as impaired due to low levels of dissolved oxygen (DO). In making this finding, the Central Valley Water Board determined that some of the designated water quality objectives and beneficial uses for DWSC are not being attained.

The CWA Section 303(d) listing for low DO in the DWSC is based on impairment to the following fisheries-related beneficial uses identified in the Basin Plan: warm freshwater species migration (WARM MIGR) and spawning (WARM SPWN), cold freshwater species migration (COLD MIGR), and warm and cold freshwater species habitat (WARM and COLD). To protect these beneficial uses, the Basin Plan requires that DO in DWSC must be at least 5.0 milligrams per liter (mg/L) at all times and not less than 6.0 mg/L from September 1 through November 30 (which is intended to protect fall-run Chinook salmon spawning migration in the San Joaquin River).

Because the DWSC was listed as impaired under section 303(d), the CWA requires that a Total Maximum Daily Load (TMDL) be established for this water body, which identifies the factors contributing to the DO impairment and apportions responsibility for correcting the problem. On January 27, 2005, the Central Valley Water Board adopted Resolution No. R5-2005-0005

(Attachment 1) that amended the Basin Plan by establishing a TMDL and a program of implementation (Control Program) for the control of factors contributing to the DO impairment in DWSC.

The numeric targets for this TMDL are the existing DO water quality objectives. The Central Valley Water Board determined that three main factors contribute to the DO impairment in the DWSC:

1. Loads of oxygen demanding substances from upstream sources that react by numerous chemical, biological, and physical mechanisms to remove DO from the water column. These substances include ammonia, organic nitrogen, and biodegradable organic matter discharged from the City of Stockton Regional Wastewater Control Facility (RWCF), algae, nutrients, and other substances originating from agricultural, wastewater, or storm water sources.

2. Channel geometry of the DWSC reduces the assimilative capacity of the DWSC for loads of oxygen demanding substances by reducing the efficiency of natural re-aeration mechanisms and magnifying the effect of oxygen demanding reactions that increase net oxygen demand. The DWSC is a portion of the San Joaquin River that has been dredged and maintained by the U.S. Army Corps of Engineers (USACOE) to a depth of 35 ft. to allow passage of ocean going ships to the Port of Stockton. Upstream of the DWSC, the San Joaquin River is otherwise about 10 ft. deep. The entire length of the DWSC is within the tidal prism and experiences regular flow reversals.

3. Reduced flow through the DWSC reduces the assimilative capacity of the DWSC by increasing the residence time for loads of oxygen demanding substances and magnifying the effect of oxygen demanding reactions that increase net oxygen demand. Flow in the DWSC may be reduced by consumptive use in the San Joaquin River watershed and other out of basin transfers and the diversion of San Joaquin River flows down Old River that result from the operation of the pumping plants for the State Water Project and the federal Central Valley Project.

"Net oxygen demand" is defined as the combined impact of all chemical, biological, and physical mechanisms that add or remove DO from the water column. When DO concentrations in the DWSC are below TMDL targets, the assimilative capacity of the DWSC for loads of oxygen demanding substances has been exceeded. "Excess net oxygen demand" (ENOD) is defined as the contribution of oxygen demanding substances or conditions beyond a level that represents attainment of standards. ENOD is calculated as the difference between measured and required DO levels multiplied by the net daily flow rate through the DWSC.

The Central Valley Water Board found that eliminating the effects of any one of the three factors, described above, would result in attainment of the targets. The Control Program therefore assigns 100 percent responsibility for reducing ENOD in the DWSC to each of those three factors. Nevertheless, the Central Valley Water Board determined that it was appropriate that each of the three factors share responsibility for remediating the DO problem and, therefore, assigned control measures to each of the factors. To account for technical uncertainty, an explicit margin of safety of 20 percent was incorporated.

The requirements of the Control Program for each of these three factors are discussed separately below:

1) Control of Point and Nonpoint Source Loading of Oxygen Demanding Substances

The TMDL allocates percent of relative responsibility for the ENOD to the point source and nonpoint source discharges that contribute oxygen demanding substances in the DWSC: 30 percent for a waste load allocation for the RWCF; 60 percent for a load allocation for nonpoint sources (defined as discharges from irrigated lands) of algae and/or precursors in the watershed; and 10 percent as a reserve for impacts from unknown sources and/or minor sources that have no reasonable potential individually to impact oxygen demand but may collectively contribute significantly.

The Central Valley Water Board also issued a prohibition for any increase in the discharge of oxygen demanding substances or their precursors to waters tributary to the DWSC portion of the San Joaquin River. This prohibition is to be reconsidered based upon the results of oxygen demand and precursor studies required in the Control Program and prevailing DO conditions in the DWSC. Also, any discharge of oxygen demanding substances or their precursors into waters tributary to the DWSC portion of the San Joaquin River is prohibited after December 31, 2011 whenever net daily flow in the DWSC is less than 3,000 cubic feet per second, unless DO objectives are being met.

The Central Valley Water Board will implement the Control Program by requiring entities responsible for point and nonpoint sources of oxygen demanding substances and their precursors within the TMDL source area to perform studies by December 2008 identifying and quantifying: a) sources of oxygen demanding substances and their precursors in the TMDL source area, b) growth or degradation mechanisms of oxygen demanding substances in transit through the source area to the DWSC, and c) the impact of the oxygen demanding substances on DO concentrations in the DWSC under a range of environmental conditions, considering the effects of mechanisms that add or remove DO from the water column in the DWSC. A study plan for addressing these information needs must be presented to the Central Valley Water Board by individual responsible entities or in collaboration with other entities.

Point source and nonpoint sources of oxygen demanding substances may need to abate less of their contribution to the extent the factors described below control conditions that contribute to the DO impairment in the DWSC.

2) Control of Oxygen Demand Conditions Controlled by DWSC Geometry

The Central Valley Water Board will require the USACOE to submit by December 31, 2006 a technical report identifying and quantifying a) mechanisms by which substances within the DWSC remove oxygen from the water column, and b) the impact of the DWSC geometry on re-aeration and other mechanisms that affect DO concentrations in the water column.

The Central Valley Water Board requests that the USACOE reduce the impacts of the existing DWSC geometry on ENOD conditions in accordance with the Control Program. The Central Valley Water Board will use its 401 certification authority when authorizing dredging and other projects to reduce the impacts that the projects have on DO in the DWSC.

3) Control of Oxygen Demand Conditions Controlled by Low Flow Conditions

The Central Valley Water Board requests that:

a) The State Water Board consider amending water rights permits for existing activities that reduce flow through the DWSC to require that the associated impacts on ENOD conditions in the DWSC be evaluated, and that their impacts reduced in accordance with the Control Program for DO, Stockton DWSC;
b) The State Water Board consider requiring evaluation and full mitigation of the potential impacts of future water rights permits or water transfer applications on reduced flow and ENOD conditions in the Stockton DWSC;
c) Agencies responsible for existing water resources facilities that reduce flow through the Stockton DWSC should evaluate and reduce their impacts on ENOD conditions in the DWSC in accordance with the Control Program for DO, Stockton DWSC;
d) Agencies responsible for future water resources facilities projects, which potentially reduce flow through the DWSC, should evaluate and fully mitigate the potential negative impacts on ENOD conditions in the Stockton DWSC.

By 2009, the Central Valley Water Board will consider all of the implementation actions and studies taken under this Control Program for the next phase (Phase 2) of this TMDL. Phase 2 will account for the quantifications of sources, and transformation of oxygen demanding substances, and require source control based on the studies. Phase 2 will also account for the success of the non-load related implementation actions such as aeration and any changes in flow or DWSC geometry that reduce ENOD.

Resolution No. R5-2005-005 authorizes the Central Valley Water Board Executive Officer to make minor, non-substantive corrections to the language of the amendment, if needed, for clarity or consistency. State Water Board staff's review of the proposed amendment identified items in the amendment that needed clarification. The Central Valley Water Board Executive Officer has made the non-substantive clarifications to the amendment (Attachment 2).

POLICY ISSUE

Should the State Water Board approve the amendment in accordance with the Staff Recommendation below?

FISCAL IMPACT

Central Valley Water Board and State Water Board staff work associated with or resulting from this action can be accommodated within budgeted resources.

REGIONAL WATER BOARD IMPACT

Yes, Central Valley Water Board.

STAFF RECOMMENDATION

That the State Water Board:

1. Approves the amendment to the Basin Plan as adopted under Central Valley Water Board Resolution No. R5-2005-0005, and as corrected by the Regional Board Executive Officer (Attachment 2).

2. Authorizes the Executive Director to submit the amendment, as approved, and the administrative record for this action to OAL and the TMDL to USEPA for approval.

DRAFT

~~September 26, 2005~~
Revised October 11, 2005

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2005-

APPROVING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS TO CONTROL FACTORS CONTRIBUTING TO DISSOLVED OXYGEN IMPAIRMENT IN THE STOCKTON DEEP WATER SHIP CHANNEL

WHEREAS:

1. The Central Valley Regional Water Quality Control Board (Central Valley Water Board) adopted a Water Quality Control Plan for the Central Valley Region, Sacramento River and San Joaquin River Basins (Basin Plan) under Resolution No. 94-380 on December 9, 1994 which was approved by the State Water Resources Control Board (State Water Board) on February 16, 1995, by the Office of Administrative Law (OAL) on May 9, 1995, and by the U.S. Environmental Protection Agency (USEPA) on May 26, 2000.

2. On January 27, 2005, the Central Valley Water Board adopted Resolution No. R5-2005-0005 **(Attachment 1)** amending the Basin Plan by establishing a control program for factors contributing to the dissolved oxygen impairment in the Stockton Deep Water Ship Channel (Control Program for DO, Stockton DWSC). The Control Program for DO, Stockton DWSC includes, as part of its implementation requirements, a Total Maximum Daily Load (TMDL) directed to the point and nonpoint source discharge of pollutants that contribute to the DO impairment.

3. Resolution No. R5-2005-005 authorizes the Central Valley Regional Board Executive Officer to make minor, non-substantive corrections to the language of the amendment, if needed, for clarity or consistency. State Water Board staff's review of the proposed amendment identified items in the amendment that needed clarification. The Central Valley Water Board Executive Officer has made the non-substantive clarifications to the amendment **(Attachment 2).**

4. The State Water Board finds that the Control Program for DO, Stockton DWSC conforms to the requirements of section 13242 of the California Water Code and State Water Board Resolution No. 68-16 and that the TMDL conforms with the requirements of section 303(d) of the federal Clean Water Act.

5. The Central Valley Water Board staff prepared documents and followed procedures satisfying all environmental documentation requirements in accordance with the California Environmental Quality Act and other State laws and regulations.

6. This Basin Plan amendment establishing the control program does not become effective until approved by the State Water Board and until the regulatory provisions are approved by OAL. The USEPA must also approve the TMDL.

7. The Basin Plan amendment, including the TMDL, can be implemented in part through actions involving the regulation of flow and water supply operations. The State Water Board does not concede that it is required under the federal Clean Water Act to submit the parts of this Basin Plan amendment that involve the regulation of flow and water supply operations to the USEPA for approval. In the view of the State Water Board, any use of flow and modifications of water supply operations to implement the Basin Plan amendment is not subject to USEPA approval.

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Approves the amendment to the Basin Plan as adopted under Central Valley Water Board Resolution No. R5-2005-0005, and as corrected by the Regional Board Executive Officer (Attachment 2).

2. Authorizes the Executive Director to submit the amendment, as approved, and the administrative record for this action to OAL and the TMDL to USEPA for approval.

CERTIFICATION

The undersigned, Acting Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on ~~October 20, 2005.~~ November 16, 2005

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~~Debbie Irvin~~
~~Clerk to the Board~~
Selica Potter
Acting Clerk to the Board